24614
24544

VOLUME 6, NUMBER 10

July 1, 1970

INFORMATION INTERSCIENCE INCORPORATED

Current Awareness Bulletin

COMPANY

2015043825

The following new accession from Volume 6(10) of the CURRENT AWARENESS BULLETIN may be of special interest to you.

24614 (p. 9)
ETHNIC CORONARY DIFFERENCES ALSO FOUND IN CHILDREN
Anonymous

Ashkenazi & Yemenite Jews

A news story reports that an autopsy study of 211 consecutive specimens (excluding those related to cardiac death) from fetuses and children under age 10 during 1963-1966 found differences in the coronary arteries in different ethnic groups which correspond to the reported prevalence of coronary heart disease (CHD) in the equivalent adult populations.

P.2 smoking not related to bladder cancer (yes lung cancer)
P.7 24834 Kunimen Twin Study
P8 CHD not related to cigarette smoking

Simon O'Shea
Project Officer
Information Storage and Retrieval System

July 1, 1970

Volume 6, Number 10 July 1, 1970

CURRENT AWARENESS BULLETIN

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EXAMPLE OF FORMAT

ACCESSION NUMBER → 05639

ORIGINAL TITLE OF ARTICLE → A CLINICOPATHOLOGICAL CONFERENCE: FROM THE OHIO STATE UNIVERSITY HOSPITAL, COLUMBUS, OHIO [1]

CATEGORY ←

AUTHORS → McMillan, J. B. (Oh State U Hosp, Columbus, Ohio)

SOURCE → Ohio Med J 63(5): 644-648; 1967

SENIOR AUTHOR AFFILIATION ←

ANNOTATION → A clinicopathologic conference is presented on a tuberculous cigarette smoker who developed an extremely anaplastic, highly invasive oat cell carcinoma of the lung. The author considers the cancer to be coincident with, rather than a consequence of tuberculosis in this case. It is pointed out that lung cancer that follows tuberculosis is almost invariably of the squamous cell type.

SECTION 1-CANCER

24414 NEW APPROACH TO CANCER [2]

Burch, P. R. J. (U Leeds Med Res Counc Environ Rad Unit, Leeds, UK)

Nature 225(5232): 512-516; 1970

An article discusses a unified theory of growth, cytodifferentiation and age-dependent disease, both neoplastic and non-neoplastic. It is postulated that beyond a certain stage of embryogenesis, a central mesenchymal system regulates normal growth through a homeostatic or feedback mechanism. "The central control has two principal sections, corresponding to the anatomical division of target tissues between those on the blood side, and those behind, blood-tissue barriers."

Spontaneous autoaggressive disease of a tissue (i.e., cancer) bearing a particular tissue coding factor (TCF) is initiated by random gene mutations in a comparator (cells which determine whether the target tissue has attained the correct size) stem cell of its central growth-control element. It is believed that the mutant mesenchymal stem cell propagates a 'forbidden clone' of similarly mutant descendant cells. 'Mutant' mitotic control proteins (MCP) attack the target tissue, the growth and size of which they usually regulate in their nonmutant form. This attack results from a changed type of cell interaction. Whereas the protein components of the normal MCP bear an identity relationship (genetic) to those of the TCF, the 'mutant' MCP is complementary to the target TCF. In the simplest form of carcinogenesis, 'mutant' MCPs probably interact directly with target cells to transform them eventually into the neoplastic state. Transformation probably entails a change in the structure of the TCF brought about by an induced change in gene expression. Invasiveness and the destruction of normal tissue by malignant tissue result from strong interactions between the altered (mutant) TCF in cancer cells and complementary TCF in the cells of normal tissue.

The model postulates that a specific autoaggressive disease can only arise in people genetically predisposed to it and that it is initiated in a predisposed person by a specific set of random gene mutations in growth - control stem cells. One or more mutations may occur in a single stem cell or in multiple stem cells. "The average rate of occurrence of each specific initiating mutation stays constant from about the time of birth to the onset of disease: it is unaffected by ordinary environments." The siting of neoplastic or degenerative foci depends on the anatomical distribution of target cells, the TCFs of which are complementary to the mutant MCPs of the forbidden clone. The gene complement at fertilization determines predisposition.

For spontaneous cancers, the principal factor in geographical variation is probably gene frequency, which determines the proportion of the community which is predisposed. "With the recent, and largely successful, conquest of the fatal infectious diseases, some of which are likely to be genetically associated (positively or negatively) with malignant diseases, we must now be living through a period of pronounced transition in gene frequencies." Cohort changes in the age-incidence of some cancers may well be the result of changing gene frequencies, produced by altered selection pressures. Should viruses prove to play an essential part in the pathogenesis of any cancer in man they could, of course, give rise to marked geographical and temporal variations in incidence.

Explanations of how chemical, radiation, and plastic film carcinogenesis operate within this theory are given.

24509 BLADDER TUMOURS AND SMOKING [1]

Anthony, H. M./Thomas, G. M. (U Leeds Med Sch, Leeds, UK)

Int J Cancer 5(3): 266-272; 1970

A survey study of 381 male and 57 female bladder papilloma and carcinoma patients, 412 male and 41 female lung cancer patients, and 275 male and 35 female surgical patients as controls demonstrated an association between current cigarette smoking and lung cancer, but no clear association was shown between smoking and bladder cancer. There were more current cigarette smokers of more than 15 cigarettes/day (substantial smokers) in the lung cancer series than in the control series in each decade, and consistently more patients currently smoking cigarettes, and with a history of having smoked more than 5 cigarettes/day or their equivalent. In the bladder cancer series there were slightly more substantial smokers than in the controls. The overall relationship of smoking to bladder tumor was weak, giving relative risks to substantial smokers as compared with all other smokers and nonsmokers of 1.9, 1.2, and 1.5 in the 5th, 6th, and 7th decades, respectively, compared to relative risks of lung cancer in substantial smokers of 2.2, 1.6, and 3.5, respectively.

It is noted that in the bladder series there were actually fewer patients currently smoking cigarettes and fewer patients who were or had been smokers of more than 5 cigarettes/day or their equivalent in pipe tobacco than in the controls, and this difference is significant in the 5th and 6th decades for those living in Leeds (urban). There was no association of pipe smoking with either lung or bladder cancer, but numbers were too small for confidence.

There was no significant difference between the smoking histories of patients with papilloma and those with carcinoma of the bladder. More papilloma patients who were substantial smokers later developed malignant tumors than members of all other groups, but the difference was not significant.

Among the few female patients under 60 years of age, there were more smokers of more than 5 cigarettes/day in the lung and bladder series than in the control series, but the difference was not significant.

The data are compatible with a weak relationship of bladder cancer with substantial current cigarette smoking only, but could also be consistent with a stronger association masked by some other carcinogenic hazards to the bladder.

Of the 186 smoking patients who presented with bladder cancer, observed deaths from the tumor exceeded those expected (as calculated from the rate of death from the tumor in those not smoking) by 26, which strongly suggests that the prognosis of the original bladder tumor or of recurrences was worse in those who continued to smoke than in nonsmokers and exsmokers. It is noted that a clear association has been demonstrated previously for continued smoking and the incidence of a second tumor of the mouth, throat and lung; however, the association observed in this study is rather different. "It appears to be the expression of either increased malignancy of the tumour or decreased resistance of the host, rather than of the true carcinogenic hazard of cigarette smoking."

It is conceded that the survey suffers from the disadvantage that the control and lung cancer data were collected before the bladder series data and that the series were not age-matched, although comparisons were made in comparable age groups.

24595 ✓ MORE LUNG CANCER BECAUSE OF STEEL? [1]
Anonymous
Canad Fam Physic 16(4): 27; 1970

See Environ. Coll. C.C. 6/25/70

"The higher output of steel in Hamilton has been cited as a possible reason for the sharp increase in lung cancer deaths in that city."

A news report discloses that the increase of lung cancer deaths

WYC Subway workers.

(100 in 1966-1968 compared with 10 per year for the previous 30 years) in an industrial sector of Hamilton, Canada, is directly in proportion with the increase in use of fluorospar (an ingredient used in the manufacturing of steel) which contains 50% fluoride. It was pointed out that these patients did not smoke an excessive number of cigarettes.

See also: 24183, p. 8

SECTION II-RESPIRATORY SYSTEM (NO CANCER)

See: 24607, p. 11

SECTION III-CARDIOVASCULAR SYSTEM

23920 ELECTROCARDIOGRAPHIC FINDINGS AMONG THE TOTAL ADULT POPULATION OF A LARGE RELIGIOUS ISOLATE [6]

Goldbarg, A. N./Kurczynski, T. W., Hellerstein, H. K., Steinberg, A. G. (Case West Reserve U, Cleveland, Ohio)
Circulation 41(2): 257-269; 1970

Electrocardiograms (ECG) recorded as part of a survey of 1303 men and 1348 women past 15 years of age belonging to a large religious isolate inhabiting regions of northwestern U.S.A., and southwestern Canada revealed that abnormal ECG features in general were associated with age, sex, and blood pressure, but not with serum cholesterol, body build (body weight and height, skin-fold thickness, or arm girth).

A total of 54 subjects had abnormal Q waves. The subjects who exhibited QS items consistent with myocardial infarction had higher blood pressure than those with a normal ECG. However, the differences in serum cholesterol between the affected and normal individuals were not significant.

Comparison of the present series with the findings of the Tecumseh study revealed similarities (that is, association of the major ECG items with blood pressure and similar sex differences) and points of contrast (that is, the relationship with serum cholesterol and different prevalence rate and sex distribution for several ECG items). "These differences suggest that multiple factors (genetic, environmental, social, and occupational) are involved."

24034 SMOKING AND CARDIOPULMONARY DISEASE: SMOKING AND CORONARY DISEASE: PART I: 6. CORONARY DISEASE IN TWINS, ONE OF WHOM IS A SMOKER AND THE OTHER A NON-SMOKER. (SWEDISH) [5]

Lundman, T. (Seraf Hosp, Stockholm, Sweden)

Lakartidningen 67(2): 91, 156-160; 1970

Results of two epidemiological studies in twins on angina pectoris, respiratory function, coronary artery disease (CAD), and blood lipid levels, rules out possible genetic or constitutional differences between smokers and nonsmokers.

A questionnaire study of about 10,000 monozygotic (MZ) and dizygotic (DZ) twin pairs of the same sex showed a clear correlation between angina pectoris and smoking among twins with discordant smoking habits.

A more detailed study of 196 twin pairs (92 MZ and 104 DZ of both sexes, aged 38-77 years, showed that respiratory symptoms (morning cough, morning expectoration, and chronic cough) were significantly more prevalent among the twins who smoked more. There was an inverse relationship between respiratory function (forced vital capacity and one-second forced expiratory volume) and the life-time smoking amount.

Symptoms of angina pectoris, myocardial infarction, or electrocardiogram changes consistent with preclinical or "silent" CAD were found in 55 of the 166 twin pairs with discordant smoking habits. In 15 cases both twins had CAD and in 40, only one; in 23 of these 40 pairs, the twin who smoked the least had CAD. No excess morbidity was found for the smoking partner when a comparison was made for the 99 twin pairs in which one twin was a smoker and the other a nonsmoker.

There was almost no difference between blood cholesterol and triglyceride levels among twins with discordant smoking habits. A comparison of these values for the 99 twin pairs in which one partner was a smoker and the other a nonsmoker showed that values were lower, but not significantly lower, among the smokers. "This result supports the view that selection mechanisms cause the differences in risk factors found between smokers and nonsmokers in conventional epidemiological studies." (Presented at a Scientific Conference on Smoking and Coronary Disease by the Swedish National Association for the Information on the Harmful Effects of Tobacco, held in Ronneby, Sweden, May 22-23, 1969.)

[Part of a Series: Document Nos. 24029-24036]

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24183 CORONARY HEART DISEASE IN SEVEN COUNTRIES: VIII. ZUTPHEN, A TOWN IN THE NETHERLANDS [2,5,7]

Van Buchem, F. S. P.

Circulation 41(4, Suppl 1): [2], i-76-i-87; 1970

An epidemiological prospective study of incidence of coronary artery disease (CAD) among male cohorts, 40 to 59 years of age, in Zutphen, the Netherlands, is reported.

The 5-year observed mortality of the men of Zutphen was closely similar to that reported in the vital statistics for all men, age-matched, in the whole of the Netherlands. The agreement was good for CAD as well as for all-causes deaths, so in these respects the men of the Zutphen cohort are reasonably representative of men of their age in the Netherlands as a whole.

Compared with U.S. white men summarized in a 5-year life table based on 1962 vital statistics, the Zutphen men were similar in all-causes deaths but had fewer deaths attributed to CAD, and the latter difference is statistically significant.

The men of Zutphen had an all-causes death rate 26% higher than that of age-matched U.S. railroad employees followed in parallel. That difference was not quite significant statistically. The 5-year age-standardized major CAD incidence (CAD deaths, infarcts, classic angina pectoris) of the Zutphen men was only two-thirds that of their U.S. railroad counterparts, and that difference was statistically significant.

Among characteristics recorded at entry, later incidence of CAD in men CAD-free at entry was related to relative body weight, to body fatness, to blood pressure, and to serum cholesterol but was not related to height, occupational physical activity, or smoking habits.

Zutphen men differ from all of the other cohorts in this cooperative study in the variety of their ways of smoking tobacco. Whereas in the other cohorts substantially all of the smokers smoke only cigarettes, the majority of the Zutphen smokers, like men in the Netherlands generally, smoke pipes or cigars besides cigarettes, or they smoke only pipes and cigars. It is interesting that in Zutphen none of the men who had never smoked developed CAD during the 5-year follow-up period, but only 31 men were at risk in that never-smoked category, so no conclusion is possible about protection afforded by never smoking.

There is nothing to indicate any significant relationship between smoking habits and the development of clinical CAD. The number of CAD cases in the various categories of smoking, however, is too small to hope for significant differences unless smoking were truly a dominant risk factor.

When men differing in relative weight or obesity but matched in blood pressure were compared, neither relative weight nor fatness showed a statistically significant relationship to CAD incidence.

All-causes 5-year deaths of the Zutphen men were related to both systolic and diastolic blood pressure but not to height, relative weight, body fatness, serum cholesterol, physical activity, or smoking habits.
[Part of a Series: Document Nos. 24179-24194]

24554 SUGAR, CIGARETTES, AND HEART-DISEASE [5]
Yudkin, J. (Queen Eliz Coll, London, UK)
Lancet 1(7656): 1111; 1970

The writer of a letter to the editor does not find very logical the arguments of two studies (Lancet, May 16, 1970, p. 1011 and p. 1014) which after claiming that both excessive sugar consumption and heavy cigarette smoking induce coronary artery disease and that persons eating much sugar tend to be heavy smokers, conclude that cigarette smoking, but not sugar consumption, is a cause of coronary artery disease. (See also Document Nos. 24475-24476.)

R Doll

24593 LITHIUM DEPLETION AND ATHEROSCLEROTIC HEART-DISEASE [5]
Livingston, H. D. (Bowm Gray Sch Med, Winston Salem, NC)
Lancet 1(7657): 1181-1182; 1970

A letter to the editor criticizes the conclusion of A. W. Voors (Lancet 2(7634): 1337, 1968) that lithium insufficiency is related to coronary artery disease (CAD) and explains the negative correlation between water hardness and CAD (higher concentrations in lithium in hard water). It is pointed out that an error must have been made in calculation of the data; in fact, the food sources of lithium can easily be in excess of the water source even in hard water areas with relatively high lithium concentrations. Therefore, the whole basis for the hypothesis linking water lithium and CAD mortality lacks experimental support.

"Clearly the inverse relationship between water lithium and atherosclerotic heart-disease is an artifact of the inverse relationship between water hardness and atherosclerotic heart-disease. The latter relationship continues to present a puzzle, but one not made any simpler by the introduction of lithium." (See also Document No. 22747.)

24614 ETHNIC CORONARY DIFFERENCES ALSO FOUND IN CHILDREN [6,9]
Anonymous
Pediatric News 4(5): 40; 1970

A news story reports that an autopsy study of 211 consecutive specimens (excluding those related to cardiac death) from fetuses and children under age 10 during 1963-1966 found differences in the coronary arteries in different ethnic groups which correspond to the reported prevalence of coronary heart disease (CHD) in the equivalent adult populations. The ethnic groups

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compared were the Ashkenazi and Yemenite Jews, and the Bedouins of Israel. There is a low prevalence of coronary atherosclerosis and CHD among Yemenite Jews and among Bedouins, both absolutely and in relation to other ethnic groups in Israel.

The intima and musculoelastic layer (tunica media) in the Ashkenazi male were more developed than in the Yemenite and Bedouin males. The differences are apparent soon after birth, but are more obvious at the end of the first year of life. The intimal tissue in the males is more developed than in the females in the Ashkenazi group. This is not true for Yemenites and occurred in only one of the three age groups of Bedouins tested.

The male predominance of intimal development in the Ashkenazi group in early life is similar to that found among American and European infants. In other studies, higher rates of myocardial infarction have been found in males of European origin than in those from Asia and Africa. The absence of differences in the intimal development between sexes in the Yemenite and Bedouin groups is similar to findings in other ethnic groups that have a low incidence of CHD.

Developmental and structural patterns of the coronary arteries were found to be similar in the three groups. The same phases representing normal stages in the development of human coronary arteries were recognized in all the subjects; however, there were "interesting qualitative differences." Changes in the internal elastic membrane, for example, which occur in the Bedouin group after birth are similar to, but less intense than, those in the other ethnic groups, and the initial elastic changes do not become more pronounced with age, as occurs in the other ethnic groups.

The low incidence of coronary atherosclerosis in the Bedouin adult life may be related to the lack of elastic changes in infancy. Elastic elements of the arteries of Negroes have been shown to have less tendency to fragment than corresponding elements of the coronary arteries of white subjects, and this finding correlates with the lower prevalence of CHD in Negroes.

The rich concentration of collagen in the intima of the young Ashkenazi males may relate to the high incidence of coronary atherosclerosis in the adult population. External factors, such as nutritional deficiency, would not explain differences in the amount of collagen tissue in the intima of Ashkenazi males and females. An intrinsic factor, probably inherited, seems a more appropriate explanation.

SECTION IV-MISCELLANEOUS

24607 CIGARETTE SMOKE: THE EFFECT OF RESIDUE ON MITOCHONDRIAL STRUCTURE [3,7]

Bioassay

Kennedy, J. R./Elliott, A. M. (U Tenn, Knoxville, Tenn)
Science 168(3935): 1097-1098; 1970

Mainstream smoke cigarette tar was found to inhibit the ciliary activity of Tetrahymena pyriformis. The most striking alteration in cell structure was in the mitochondria. Alteration of the inner mitochondrial network increased with continuous exposure, but the outer mitochondrial membrane appeared unaffected. Mitochondrial swelling generally observed after exposure to other noxious agents did not occur. In fact there seemed to be increased inward folding of the outer mitochondrial membrane. It was at this time that reduction of ciliary beat was most pronounced.

one cell animal

It is pointed out that in cells exposed to tar for as long as 70 minutes, when ciliary loss and cell death were imminent, remnants of the inner tubular network persisted. "Thus it may be that only those mitochondria which were functionally active were altered by residue. The gaseous phase, although also ciliatoxic, did not seem to cause breakdown of the inner mitochondrial membranes. It did, however, cause swelling of the mitochondria.

"The ciliatoxic effects of cigarette smoke have been demonstrated in experimental animals from a number of different phyla, such as respiratory epithelium of humans, rabbits, rats ... . Thus, a similar effect in Tetrahymena was expected. Several investigators have attributed major ciliatoxic effects to the gaseous phase of cigarette smoke. For example, another ciliated protozoan, Paramecium aurelia, tolerated nicotine concentrations above those found in cigarette smoke. However, the ciliatoxic effect of the gas phase was almost as great as that

of whole smoke, suggesting that the toxic component resides primarily in the gaseous phase of cigarette smoke. Similar conclusions have been drawn from studies on mammalian respiratory cilia. Other investigators have found that the volatile, acidic, and phenolic fractions were the most toxic to clam gill cilia. Some of this fraction may reside in the particulate matter.

"Contrary to many of these observations we have found what appears to be a twofold effect, depending on whether the particulate or gaseous phases were employed. The general disruption of internal mitochondrial structure associated with the particulate phase of cigarette smoke would undoubtedly block energy production for ciliary activity. However, the gaseous phase, considered by others to be more toxic, causes mitochondrial structure."

24660 CIGARETTE NICOTINE CONTENT AS A DETERMINANT OF HUMAN SMOKING BEHAVIOR [7]

Goldfarb, T. L./Jarvik, M. E., Glick, S. D. (Alb Einst Coll Med, New York, NY)

Psychopharmacologia 17(1): 89-93; 1970

A five week study of smoking behavior in 15 volunteers, aged 20-43, (each had been smoking at least 20 cigarettes/day for two or more years) concludes that subjects do perceive differences in nicotine content of cigarettes, but that the physiological effects of these quantitative differences do not necessarily correlate with perceived psychological effects.

Groups of five subjects allowed to smoke unlimited numbers of lettuce cigarettes with 0%, 2%, and 3% nicotine, respectively, for one week's duration each showed a general decrease in smoking rate for all types of experimental cigarettes as compared to the rate with their own brand regardless of weekly order in which cigarettes were smoked. The decreased smoking rate at the end of three weeks was carried over to smoking of their own brand of cigarettes.

Psychological measurements of cigarette strength show that most subjects could detect that the nicotine content of the three experimental cigarettes was different, thus causing the higher nicotine cigarettes to be rated as tasting stronger. The "quality" ratings show that no subjects liked the experimental cigarettes more than their own brands; all subjects complained about the taste of the lettuce cigarettes throughout the experiment. Most subjects, upon returning to their own brand (after having smoked the experimental cigarettes for three weeks), found them somewhat stronger than before, and on the whole less satisfying.

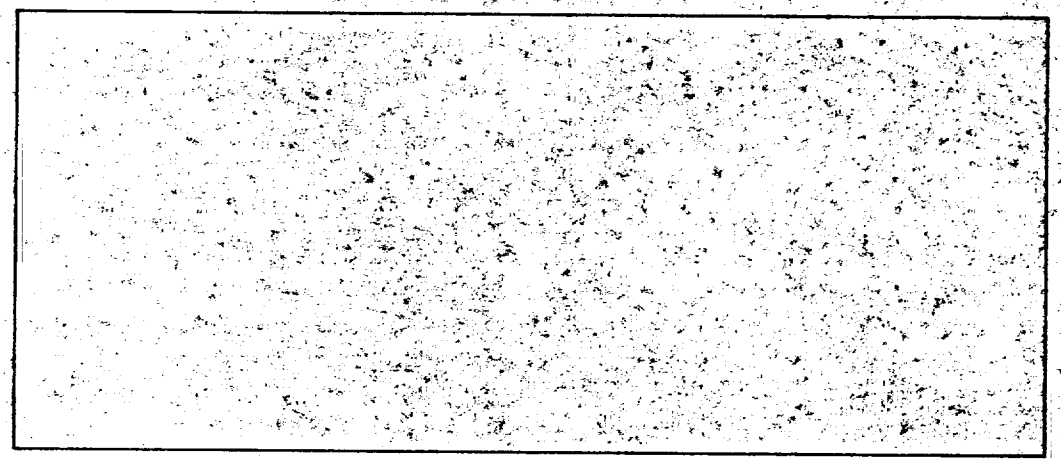
The component of habit in human smoking seems quite strong especially when it is realized that after at least two years of

smoking, the subjects found even their own brands at best "moderately satisfying." It should also be noted that even though they disliked the experimental cigarettes, all of the subjects continued to smoke them at a high rate (more than 10 cigarettes/day). This would indicate a fair degree of functional autonomy of the smoking habit from nicotine.

See also: 24183, p. 8

SECTION V-MEDICAL OPINION

See: 24614, p. 9



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